

Measuring Endogenous Corticosterone in Laboratory Mice – a Mapping Review, Meta-Analysis, and Open Source Database

Supplementary Data

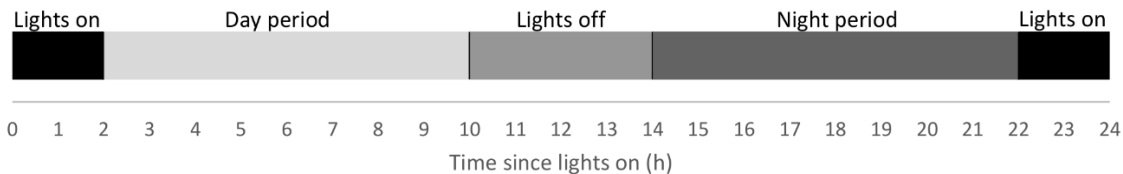


Fig. S1: Transformation of time since lights on into a categorical variable

0 is defined as the moment the lights are turned on. "Lights on" encompasses all concentrations measured 22-2 hours, "day period" between 2-10 hours, "lights off" between 10-14 hours, and "night period" between 14-22 hours

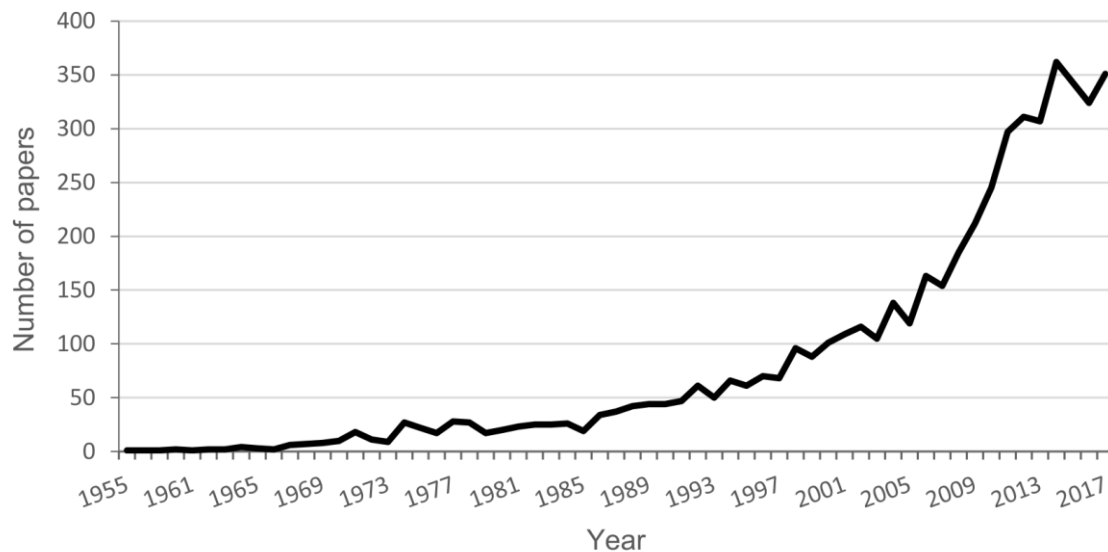


Fig. S2: Number of published papers per year measuring endogenous corticosterone in mice

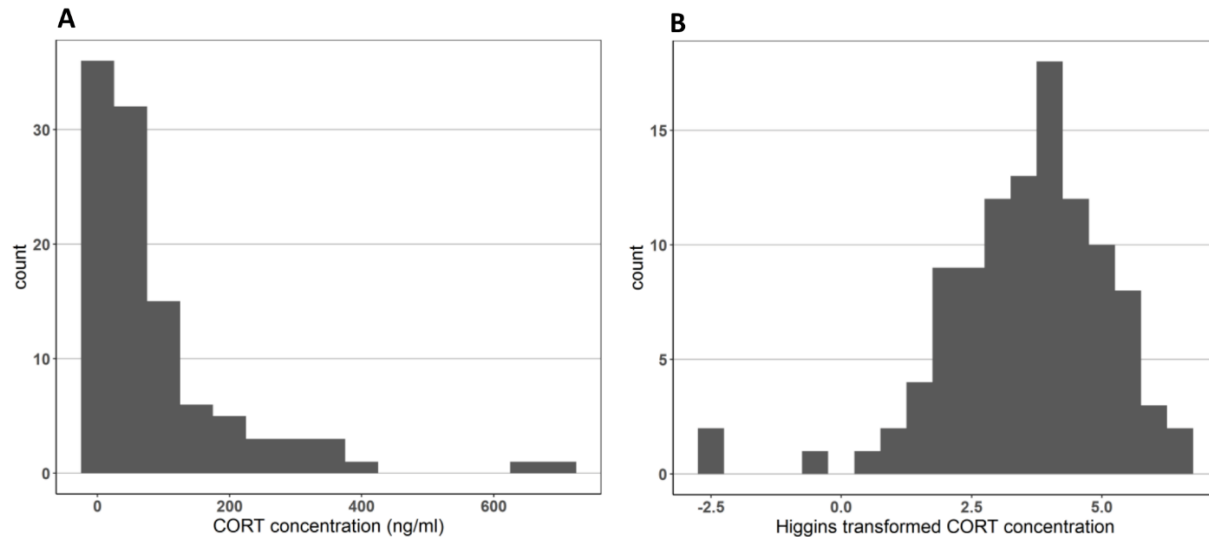


Fig. S3: Histogram of all raw corticosterone concentrations included in the meta-regression (A) and the concentrations after the Higgins transformation (B)

Tab. S1: All studies included in the meta-regression of the 2012 articles, including the N, corticosterone concentration in ng/ml, and the accompanying standard deviation per data point

Note that the data are not per study, but per eligible group of mice. For example, a study using two different mouse strains can have two data points for the meta-regression. Full information on the articles is available in the database ([doi:10.14573/altex.2004221s2](https://doi.org/10.14573/altex.2004221s2))

Authors	Title	N	Concentration (ng/mL)	SD
Pillai, A. G. et al.	Dendritic morphology of hippocampal and amygdalar neurons in adolescent mice is resilient to genetic differences in stress reactivity	8	5.09	4.84
		8	3.78	4.3
		8	1.95	0.41
Ribes, D. et al.	Recognition memory and β -amyloid plaques in adult Tg2576 mice are not modified after oral exposure to aluminum	7	58.90	48.93
Guo, M. et al.	Forebrain glutamatergic neurons mediate leptin action on depression-like behaviors and synaptic depression	5	113.99	17.75
Hartmann, J. et al.	Fkbp52 heterozygosity alters behavioral, endocrine and neurogenetic parameters under basal and chronic stress conditions in mice	10	13.24	5.60
Enayati, M. et al.	Maternal infection during late pregnancy increases anxiety- and depression-like behaviors with increasing age in male offspring	12	54	7.43
		12	55.75	6.34
		12	49.67	6.08
Trent, S. et al.	Steroid sulfatase-deficient mice exhibit endophenotypes relevant to Attention Deficit Hyperactivity Disorder	6	6.06	5.12
Ros-Simó et al.	Early-life social experiences in mice affect emotional behaviour and hypothalamic-pituitary-adrenal axis function	9	49.1	30.9
		9	34.1	12.6
		9	21.4	13.8
Pastor, R. et al.	Role of corticotropin-releasing factor and corticosterone in behavioral sensitization to ethanol	12	378.95	299.32
Sousa et al.	Neuropeptide Y Y1 receptor antagonism increases bone mass in mice	6	322	151.87

Tramullas et al.	Chronic psychosocial stress induces visceral hyperalgesia in mice	14	33.7	8.77
Steyn, F. J. et al.	GH does not modulate the early fasting-induced release of free fatty acids in mice	5	371	118.28
Roggero, E. et al.	Different peripheral neuroendocrine responses to <i>Trypanosoma cruzi</i> infection in mice lacking adaptive immunity	6	11.37	4.43
Neufeld-Cohen, A. et al.	Chronic activation of corticotropin-releasing factor type 2 receptors reveals a key role for 5-HT _{1A} receptor responsiveness in mediating behavioral and serotonergic responses to stressful challenge	13	181.53	88.49
Stucchi, P. et al.	Circadian feeding drive of metabolic activity in adipose tissue and not hyperphagia triggers overweight in mice: Is there a role of the pentose-phosphate pathway?	10	210.43	177.09
		10	220.18	84.52
Zhai, Y. J. et al.	Protective effect of extract of chicken meat on restraint stress-induced liver damage in mice	10	13.32	2.43
Guéguinou, N. et al.	Stress response and humoral immune system alterations related to chronic hypergravity in mice	12	273.48	114.34
Razzoli, M. et al.	Implication of the VGF-derived peptide TLQP-21 in mouse acute and chronic stress responses	10	65.06	39.18
Boitard, C. et al.	Juvenile, but not adult exposure to high-fat diet impairs relational memory and hippocampal neurogenesis in mice	10	24.6	25.93
		10	31.8	13.60
Zhang, L. F. et al.	Increased hippocampal tau phosphorylation and axonal mitochondrial transport in a mouse model of chronic stress	6	253.59	126.43
Oishi, K. et al.	Low-carbohydrate, high-protein diet affects rhythmic expression of gluconeogenic regulatory and circadian clock genes in mouse peripheral tissues	3	284.97	114.14
Kogure, M. et al.	Moxibustion at mingmen reduces inflammation and decreases IL-6 in a collagen-induced arthritis mouse model	5	4.6	1.79
Oyola, M. G. et al.	Anxiolytic effects and neuroanatomical targets of estrogen receptor- β (ER β) activation by a selective ER β agonist in female mice	9	348.78	80.18
Gonik, M. et al.	The endocrine stress response is linked to one specific locus on chromosome 3 in a mouse model based on extremes in trait anxiety	12	6.79	6.02
		11	10.78	9.37
Yanai, S. et al.	Remarkable changes in behavior and physiology of laboratory mice after the massive 2011 Tohoku earthquake in Japan	11	64.6	68.32
Moussaieff, A. et al.	Incense acetate reduces depressive-like behavior and modulates hippocampal BDNF and CRF expression of submissive animals	5	54.42	29.01
		7	124.81	17.69
Czyzyk, T A. et al.	Mice lacking delta-opioid receptors resist the development of diet-induced obesity	7	11.03	10.69
LeGates, T. A. et al.	Aberrant light directly impairs mood and learning through melanopsin-expressing neurons	5	126.76	39.28
Ter Horst, J. P. et al.	Sex differences in fear memory and extinction of mice with forebrain-specific disruption of the mineralocorticoid receptor	9	13.07	17.33
		9	16.72	15.50
Suárez-Souto, M. A. et al.	Caloric restriction modifies both innate and adaptive immunity in the mouse small intestine	6	17.2	10

Lutfy, K. et al.	Nicotine stimulates secretion of corticosterone via both CRH and AVP receptors	7	120.12	27.98
Berger, S. M. et al.	A functional Tph2 C1473G polymorphism causes an anxiety phenotype via compensatory changes in the serotonergic system	15	48.52	20.34
		15	45.85	16.20
Gurfein, B. T. et al.	The calm mouse: An animal model of stress reduction	10	0.11	0.06
		10	0.09	0.06
Jacobsen, J. P. R. et al.	Deficient serotonin neurotransmission and depression-like serotonin biomarker alterations in tryptophan hydroxylase 2 (Tph2) loss-of-function mice	6	32	17.90
Bartlang, M. S. et al.	Time matters: Pathological effects of repeated psychosocial stress during the active, but not inactive, phase of male mice	7	65.43	37.01
		6	19.86	14.37
Otsuka, T. et al.	Photoperiod regulates corticosterone rhythms by altered adrenal sensitivity via melatonin-independent mechanisms in Fischer 344 rats and C57BL/6J mice	4	54.03	36.29
		4	30.36	11.81
Dalm, S. et al.	Post-training reward partially restores chronic stress induced effects in mice	20	32.69	13.17
Coutinho, A. E. et al.	11beta-hydroxysteroid dehydrogenase type 1, but not type 2, deficiency worsens acute inflammation and experimental arthritis in mice	5	87.64	30.21
Bagamasbad, P. et al.	Molecular basis for glucocorticoid induction of the krüppel-like factor 9 gene in hippocampal neurons	8	48.9	28.85
Boleij, H. et al.	Not all mice are equal: welfare implications of behavioural habituation profiles in four 129 mouse substrains	8	128.53	121.34
		8	112.53	91.11
		8	27.62	27.62
		8	72.76	72.77
Benedetti, M. et al.	Plasma corticosterone levels in mouse models of pain	8	12.66	11.64
		8	8.30	3.52
Jiang, B. et al.	Antidepressant-like effects of ginsenoside Rg1 are due to activation of the BDNF signalling pathway and neurogenesis in the hippocampus	10	61.2	88.86
Ho, N. et al.	Depressive phenotypes evoked by experimental diabetes are reversed by insulin	8	28.9	25.27
Forbes, S. et al.	A role for neuropeptide y in the gender-specific gastrointestinal, corticosterone and feeding responses to stress	6	101.65	52.63
		5	116.53	38.81
Kinoshita, C. et al.	Chronic stress affects PERIOD2 expression through glycogen synthase kinase-3 β phosphorylation in the central clock.	6	13.54	17.61
Kember, R. L. et al.	Maternal separation is associated with strain-specific responses to stress and epigenetic alterations to Nr3c1, Avp, and Nr4a1 in mouse	14	23.86	13.58
		8	23.35	18.09
		10	19.29	17.38
		12	32.79	26.59
Innos, J. et al.		8	86.34	54.84

	Deletion of the Lsamp gene lowers sensitivity to stressful environmental manipulations in mice	8	42.51	15.44
Teilmann, A. C. et al.	The effect of automated blood sampling on corticosterone levels, body weight and daily food intake in permanently catheterized male BALB/c mice	7	283.29	217.56
Yamaura, K. et al.	Antidepressant-like effects of young green barley leaf (<i>Hordeum vulgare</i> L.) in the mouse forced swimming test	8	39.62	66.71
Schoenfelder, Y. et al.	Behavioural consequences of p-glycoprotein deficiency in mice, with special focus on stress-related mechanisms	7	17.19	11.61
Regev, L. et al.	Site-specific genetic manipulation of amygdala corticotropin-releasing factor reveals its imperative role in mediating behavioral response to challenge	11	0.86	1.02
Chesworth, R. et al.	The response of neuregulin 1 mutant mice to acute restraint stress	11	132.65	268.49
		17	50.17	59.10
Minni, A. M. et al.	Critical role of plasma corticosteroid-binding-globulin during stress to promote glucocorticoid delivery to the brain: Impact on memory retrieval	5	19.31	9.34
Winkler, R. et al.	Histone deacetylase 6 (HDAC6) is an essential modifier of glucocorticoid-induced hepatic gluconeogenesis	5	60	15.65
Kalliokoski, O. et al.	Quantitative effects of diet on fecal corticosterone metabolites in two strains of laboratory mice	16	81.28	57.58
Ren, J. et al.	Anxiety-related mechanisms of respiratory dysfunction in a mouse model of rett syndrome	6	78	24.49
Jacobsen, K. R. et al.	The effect of isoflurane anaesthesia and vasectomy on circulating corticosterone and ACTH in BALB/c mice	11	47.3	34.11
Abrahams, L. et al.	Biomarkers of Hypothalamic-Pituitary-Adrenal Axis activity in mice lacking 11B-HSD1 and H6PDH.	12	3.63	3.12
Cuffe, J. S. M. et al.	Maternal corticosterone exposure in the mouse has sex-specific effects on placental growth and mRNA expression	7	373.1	147.71
Auvinen, H. E. et al.	The effects of high fat diet on the basal activity of the hypothalamus-pituitary-adrenal axis in mice	9	8.97	1.38
		9	9.31	1.38
McQuaid, R. J. et al.	Environmental enrichment in male CD-1 mice promotes aggressive behaviors and elevated corticosterone and brain norepinephrine activity in response to a mild stressor	10	116.70	53.37
		8	106.28	55.86
Godínez-Victoria, M. et al.	Effects on secretory IgA levels in small intestine of mice that underwent moderate exercise training followed by a bout of strenuous swimming exercise	6	50.17	5.09
Kil, I. S. et al.	Feedback Control of Adrenal Steroidogenesis via H2O2-Dependent, Reversible Inactivation of Peroxiredoxin III in Mitochondria	6	176.15	22.48
Yang, X. et al.	Glucocorticoid-induced loss of DNA methylation in non-neuronal cells and potential involvement of DNMT1 in epigenetic regulation of Fkbp5	12	22.9	20.79
Solomon, M. B. et al.	Deletion of forebrain glucocorticoid receptors impairs neuroendocrine stress responses and induces depression-like behavior in males but not females	11	261.19	229.35
Vaughan, O. R. et al.		30	632	328.63

	Maternal corticosterone regulates nutrient allocation to fetal growth in mice	30	714	224.57
Breuillaud, L. et al.	Deletion of CREB-regulated transcription coactivator 1 induces pathological aggression, depression-related behaviors, and neuroplasticity genes dysregulation in mice	28	68.08	48.36
Berry, A. et al.	Social deprivation stress is a triggering factor for the emergence of anxiety- and depression-like behaviours and leads to reduced brain BDNF levels in C57BL/6J mice	8	12.4	7.17
		8	13.33	4.54
Desbonnet, L. et al.	Physiological and behavioural responsivity to stress and anxiogenic stimuli in COMT-deficient mice	10	166	72.73
		8	102	62.23
Huang, Y. F. et al.	Vascular endothelial growth factor-dependent spinogenesis underlies antidepressant-like effects of enriched environment	18	41.47	3.10
Van der Sluis, R. J. et al.	Adrenalectomy stimulates the formation of initial atherosclerotic lesions: reversal by adrenal transplantation	18	188.41	98.13
Renquist, B. J. et al.	Melanocortin-3 receptor regulates the normal fasting response	17	105.28	135.34
Zhu, W. L. et al.	Green tea polyphenols produce antidepressant-like effects in adult mice	6	17.13	3.48
Takeshita, H. et al.	Long-term voluntary exercise, representing habitual exercise, lowers visceral fat and alters plasma amino acid levels in mice	8	146	16
		8	158	24
Sakakibara, H. et al.	Social isolation stress induces hepatic hypertrophy in C57BL/6J mice	15	101.8	4.6
Ter Horst, J. P. et al.	Stress or no stress: Mineralocorticoid receptors in the forebrain regulate behavioral adaptation	15	8.29	2.71